

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

aS622.S6

May

1982

Volume 3, Number 2

Soil and Water Conservation News

LIBRARY 260-5
File Code 2597-b

United States Department of Agriculture
Soil Conservation Service



Soil and Water Conservation News is the official magazine of the Soil Conservation Service. The Secretary of Agriculture has determined that publication of this periodical is necessary in the transaction of public business required by law of the Government. Use of funds for printing *Soil and Water Conservation News* has been approved by the Director of the Office of Management and Budget through January 31, 1987. *Soil and Water Conservation News* (ISSN-0199-9060) is published 12 times a year. Postage paid at Washington, D.C.

Magazine inquiries

Send inquiries to: The Editor, *Soil and Water Conservation News*, Public Information Staff, Soil Conservation Service, U.S. Department of Agriculture, P.O. Box 2890, Washington, D.C. 20013.

Subscriptions

\$12 per year, \$15 foreign. Single copy domestic, \$2; foreign, \$2.50. Discounts of 25 percent on orders of 100 or more sent to the same address. Order directly from:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Comments: Guest Editorial

Fifty years of soil and water conservation. Something to be very proud of... something to celebrate.

The Soil Conservation Service was created on April 27, 1935. Plans are already well under way for historic conservation exhibits, speeches, recognition of early leaders, publications, special editions and programs, and even commemorative postage stamps.

We will be celebrating 50 years of innovative effort in soil and water conservation by farmers and ranchers, conservation districts, farm and ranch organizations, and thousands of SCS field employees and Civilian Conservation Corps workers and camp leaders.

Many organizations are working to make a success of 50th anniversary events:

- The National Association of Conservation Districts, whose members can look back to model enabling legislation in 1937. The same year, the first Soil Conservation Districts law enacted in the United States was signed by the Governor of Arkansas;
- The Soil Conservation Society of America, which is coordinating its 1984 annual meeting theme with the observance, and whose North Carolina chapter plans activities at Hugh Hammond Bennett's home place to honor the first SCS Chief;
- A growing number of State district associations and State conservation agencies;
- The Agricultural History Society, which is aiding SCS on a symposium about the history of the conservation movement.

Ideas are coming from all parts of the country, and other suggestions are welcome.

In 1984, we also will observe 30 years of progress under Public Law 566, and there will be many other milestones to mark before and after the 50th anniversary.

These are opportunities to help America learn from the past and prepare for the future; to remind every citizen that the resource conservation job, far from being over, is a continuing serious challenge to the future of agriculture.



Francis T. Holt
General Chairperson
SCS 50th Anniversary Committee

Cover: Stripcropping on a Washington County, Va., farm. (Photo, Tim McCabe, photographer, Public Information Staff, SCS, Washington, D.C.)

John R. Block
Secretary of Agriculture

Peter C. Myers, Chief
Soil Conservation Service

All programs of the U.S. Department of Agriculture are available to everyone without regard to race, creed, color, sex, age, or national origin.

Editor, Judith E. Ladd
Associate Editor, Nancy M. Garlitz
Assistant Editor, Donald L. Comis
Editorial Assistant, Ann P. Serota
Design Consultant, Christopher Lozos

Reprint permission
Contents of this magazine may be reprinted without special permission. Mention of source is requested. Photos available on request.

Commercial names
Mention of commercial enterprises or brand names does not constitute endorsement or imply preference by the U.S. Department of Agriculture.

News Briefs

SCS Introduces Land Evaluation System Nationwide

This year the Soil Conservation Service is introducing the Agricultural Land Evaluation and Site Availability Assessment System to help State and local governments identify and preserve important farmland.

The national evaluation system has two parts. The first, Agricultural Land Evaluation, gives an overall evaluation of the farmland in an area by using a computer to assign numerical ratings based on four factors: whether it is prime farmland or not; its productivity index; its land capability classification; and its economic viability as farmland.

The second part of the system, the Site Availability Assessment, evaluates a specific site on the basis of other factors, such as distance from urban areas, zoning, and availability of alternative sites.

A U.S. Department of Agriculture interagency committee, led by SCS Land Use Planner Lloyd Wright, developed the system and tested it last year in 12 counties in 6 States. It worked so well that USDA sent a team of people this year on a national tour to explain the system.

This year is an excellent time to introduce the system because the Agriculture and Food Act of 1981 requires Federal agencies to avoid contributing to unnecessary conversion of important farmland.

The system will give States and local governments criteria to identify farmland that is of statewide or local importance, even if it is not prime or unique farmland. The system also gives them a new way to compute preferential tax assessments to preserve farmland.

Now State and local governments

have a technique available to make agricultural land protection decisions that are consistent and legally defensible.

Study Shows Money Limits Farming of Potential Cropland

An Oklahoma State University researcher has analyzed land ownership patterns on 127 million acres of potential cropland, currently mostly forest land and pastureland, and found that owners of 43 percent of this land face economic obstacles that can prevent them from ever farming it.

The researcher, Linda K. Lee, did the study in cooperation with the U.S. Department of Agriculture's Economic Research Service (ERS). She used data collected by the Soil Conservation Service for the 1977 National Resources Inventory and a 1978 landownership survey by ERS.

Lee found that some owners can make more money by selling their land for homes or prefer to use the land for their own enjoyment. Other owners do not have the time to reap the benefits of farming because they are older or too close to urban areas to survive as farmers. Still others do not have enough money to convert the land or have parcels that are too small to farm profitably.

These obstacles are particularly present in the Northeast and Pacific regions.

A limited number of single copies of Lee's study, "Potential Cropland: The Ownership Factor" (AER-476), are available free from EMS Publications, Room 0054-South, U.S. Department of Agriculture, Washington, D.C. 20250.

SCS Tests New Wetlands Classifications

This year the Soil Conservation Service is testing the U.S. Department of the Interior's (USDI) latest wetlands classification system in one to three counties in each of nine States.

USDI's Fish and Wildlife Service (FWS) published this system in December 1979 in a publication titled "Classification of Wetlands and Deepwater Habitats of the United States." This publication replaces Circular 39, "Wetlands of the United States," published in 1956, on which current SCS wetlands policy is based.

To test the system, SCS is mapping wetlands and classifying them according to Circular 39 and according to the newer system.

The newer system is more detailed and more scientific than the old system and includes keys to 5 system names and 11 class names. The old system listed 20 types of wetlands and interpreted their value for waterfowl.

SCS will discuss the results of the tests with the FWS and authors of the classification system to see if they can resolve any major technical problems that SCS might find before SCS decides whether to adopt the latest system.

"Classification of Wetlands and Deepwater Habitats of the United States" is available for \$4.75 from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. (Stock No. 024-010-00524-6.)

New Conservation Tillage Group Formed

Three hundred Manitoba and North Dakota farmers approved basic by-laws and officially formed the Manitoba-North Dakota Zero Tillage Farmers Association at a 2-day workshop held in January in Minot, N. Dak.

The Association listed three main purposes: to facilitate the exchange of ideas; to encourage zero tillage, or no-till, research; and to disseminate zero tillage information. An important purpose also approved at the meeting was "to preserve our agricultural soil resource for further generations by promoting a system which drastically reduces soil erosion and builds up organic matter."

A board of 10 elected farmers will guide the Association, five from North Dakota and five from Manitoba. Appointed advisors from government and industry will counsel the officers and board members. Membership is open to any farmer interested in zero tillage, not only those from Manitoba and North Dakota but also those from surrounding Provinces and States.

The Association approved a \$20 annual membership fee for farmers and a \$10 associate, nonvoting membership fee for extension, research, commercial firm representatives, and others. Membership fees can be sent to Bob Nowatzki, Secretary-Treasurer, Manitoba-North Dakota Zero Tillage Farmers Association, Rt. 3, Box 68A, Langdon, N. Dak. 58249.

Speakers at the Zero Tillage workshop emphasized the soil conservation benefits of no-till. Keynote speaker Lyle Samson, Soil Conservation Service agronomist in North Dakota, detailed the alarming soil loss that can occur from bare land. He pointed out that bare land occurs

most frequently from summer fallow, fall plowing, intensively tilled seedbeds, and clean-tilled row crops. He said soil conservationists see no-till crop production as a way to eliminate the bare land risk periods.

Samson translated soil loss into nutrient loss, explaining that 1 ton of soil contains about 5 pounds of nitrogen, 3 pounds of phosphate, and 16 pounds of potash. At today's fertilizer prices, this is about \$4 worth of nutrients per ton of soil.

He cited an example of a North Dakota farmer who lost 28 tons of soil per acre in 1981 on gently sloping land. That converts to \$112 per acre in lost nutrients. Samson gave other examples that showed that soil loss and equivalent nutrient loss would be much higher on steeper, unprotected land.

Another workshop speaker, Carl Fanning, North Dakota State University extension soils specialist, underlined soil conservation concerns. He spoke on the microbiological process in the soil and the importance of residue recycling. According to Fanning, an adequate level of organic matter is essential to maintain soil productivity and no-till offers farmers the chance to restore organic matter to adequate levels.

No-Till News

Two Resource Conservation and Development (RC&D) Areas have published 60,000 copies of a new conservation tillage newspaper, "No-Till—The Future Is Now." The Geode Wonderland and Pathfinders RC&D Areas distributed the newspaper in 10 counties of southeast Iowa last February to promote no-till farming.

Topics covered in the newspaper included resource management, chemical application, equipment, and research projects. A special political forum section held commentaries from Secretary of Agriculture John R. Block, Iowa Governor Robert D. Ray, Senators Roger Jepsen and Charles Grassley, and Congressman Jim Leach.

The 28-page newspaper contained a different two-page center section for each of the 10 counties participating in the project. Many soil conservation districts used this avenue to publish their annual report. These pages also highlighted local RC&D activities.

Copies of the newspaper are available from the Pathfinders RC&D Office, 50 E. Washington Avenue, Fairfield, Iowa 52556.

SCS in Florida Develops Ecological Descriptions

The Soil Conservation Service in Florida is using soil surveys as the basis for descriptions of Florida's ecological communities for land-use planning in natural areas.

In 1975, a group of SCS specialists at the Florida State Office, led by State Resource Conservationist Robert Craig, recognized the need for such descriptions to identify natural communities by looking at soil survey maps before visiting a site.

Using soil as the primary basis for the descriptions, the specialists divided Florida into 26 soil-plant-animal communities. The theory is that soil (along with other factors such as climate and topography) determines potential vegetation and that vegetation determines the potential wildlife.

The specialists described each community and attached lists of all

the associated soils, plants, and animals. Each description tells: where the community is; what soils, plants, and animals represent the community; and what land uses it is suitable for. The description also identifies endangered or threatened plants and animals that might occur in a community.

SCS used the descriptions for the first time in 1977, to design a conservation plan for the Florida Nature Conservancy's Janet Brooke Preserve, a 320-acre native woodland area 50 miles north of Tampa. As part of the plan, SCS designed a trail that visitors can follow through more than four communities. Following SCS recommendations, the Conservancy covered the trail with mulch where it crosses the loose, sandy soil of the longleaf pine/turkey oak hills community and built a boardwalk over a freshwater marsh and pond community.

SCS has used the system to write conservation plans for other preserves managed by the Florida Nature Conservancy, the National Audubon Society, and other environmental groups, and for parks, schools, homes, ranches, and farms.

For years SCS field offices in Florida have had the lists of soils, plants, and animals in their technical guides. In 1980, SCS updated the system and wrote a computer program that produces the lists in tables.

SCS plans to publish the tables and descriptions in a book, with photographs of each community, and distribute it to the many users in Florida, from environmental consultants to Florida's State Division of Forestry and the Florida State Museum.

Donald L. Comis,
assistant editor, *Soil and Water Conservation News*, SCS, Washington, D.C.

Green Thumb Workers

Green Thumb, Inc., is a private organization that provides opportunities for older Americans to do public service jobs. Conservation districts are eligible as host agencies.

Funded by the U.S. Department of Labor, Green Thumb pays the wages for the part-time workers. The host agency provides supervision, training, materials, and equipment.

For further information, contact the Green Thumb office in your State or write to Peggy Chester, Green Thumb, Inc., 1401 Wilson Blvd., Suite 108, Arlington, Va. 22209.

Announcing the New, Improved, Economy-Size Soil and Water Conservation News

Beginning with this issue, you will be receiving the new, economy-size *Soil and Water Conservation News*. In an effort to cut costs, we are reducing the number of pages per issue to 12. Other changes, to be made in future issues, include fitting more information per page; publishing the meetings sections twice a year, in June and December; and printing more short news articles.

We will continue to provide you with the top stories in soil and water conservation. More district-level reporters are needed to provide us with short items on new ideas and developments. Please send your articles to the editor, *Soil and Water Conservation News*, Soil Conservation Service, P.O. Box 2890, Washington, D.C. 20013.

SCS Marks 25 Years of Resource Inventories

by Keith O. Schmude

The ongoing 1982 National Resources Inventory (NRI) marks the 25th anniversary of Soil Conservation Service work in conducting nationwide resource inventories. SCS first began mapping soils and land use on statistically selected sample areas in every county in the Nation in 1957. It was the first effort ever undertaken to survey U.S. land resources and the need for conservation treatment.

The resource data collected were reported in the first National Inventory of Soil and Water Conservation Needs, referred to as the Conservation Needs Inventory (CNI), completed in 1958. The data were updated in the 1967 CNI. Both the 1958 and 1967 CNI's were statistically designed for interpretation at the county level. The resource data included land capability, land use, and conservation needs.

The 1975 Potential Cropland Study was based on a small subsample of the 1967 CNI and was the least intensive of all the resource inventories conducted by SCS. It was designed to provide resource data on a national level and according to the 10 farm production regions. It provided information on land use and land having potential for development for cropland. Land that was not being used for cropland was rated as having zero, low, medium, or high potential for conversion to cropland.

The 1977 and 1982 NRI's have marked the threshold of a new series of SCS soil, water, and related resources inventories. Both NRI's contain multi-resource data collected and analyzed for use by many types of land users such as Federal, State, and local agencies and agricultural industries.

The 1977 NRI was the first step in collecting these more comprehensive

multi-resource data. It included information on land use, conservation needs, and land capability, as did the CNI's of the past. However, several new resource elements were added, including data on sheet, rill, and wind erosion; wetlands; floodprone areas; potential cropland; prime farmland; and several other resource concerns. A closely related but separate study on erosion of streambanks, gullies, roads, and construction areas made up a second phase of the 1977 NRI and was completed in 1980.

The 1977 NRI was initiated, designed, and carried out within the same year. Limited funding and a tight schedule required a sampling scheme that provided resource data designed for interpretation at no lower than the State level. These data provided the major foundation of the resource information used in the 1980 appraisal report of the Soil and Water Resources Conservation Act of 1977 (RCA).

The RCA effort has demonstrated a strong need for still more detailed and comprehensive data on the natural and related resources of the Nation. To meet this need, SCS has placed high priority on designing and carrying out the most comprehensive resources inventory SCS has ever conducted, the 1982 NRI. It is designed to meet four major goals:

1. To collect resource data on all the elements covered by the 1977 NRI plus information on critically eroding areas, wildlife habitat, vegetative cover and conditions, saline and alkaline areas, and other elements affecting the condition of vegetation and conservation of soil, water, and related resources;

2. To collect resource data at a level of reliability that will serve the most users;
3. To provide a statistical method for

detecting changes in land use for the 5-year interval from 1977 to 1982; 4. To complete the inventory field work during calendar year 1982 and the data processing before the end of fiscal year 1983. (To represent 1982 conditions, a final update of certain data will be made during 1982.)

Although the original inventory design used for the 1958 CNI has been updated and modified periodically, the original sample areas are still being used for the 1982 NRI. These sample plots, now referred to as primary sample units, have also been used in varying degrees for several other inventories including the 1967 CNI, the 1975 Potential Cropland Study, and the 1977 NRI. The Iowa State University Statistical Laboratory in Ames, Iowa, has assisted in designing all of these inventories.

In 1956, then Secretary of Agriculture Ezra Taft Benson directed SCS to lead seven other USDA agencies in conducting an inventory of the Nation's land resources and the need for conservation treatment. In the USDA bulletin authorizing the inventory, Benson said, "Our resources are not, however, inexhaustible. They must be cared for and used wisely that their productiveness will be continuing. To assure their wise use we need basic facts about the physical problems of conservation—their magnitude and relative urgency. . . ." This was never more true than now. The 1982 NRI and other SCS resource inventories are indispensable tools in planning and making wise land use decisions.

Keith O. Schmude,
soil scientist, Inventory and Monitoring,
SCS, Washington, D.C.

Feeding Prison Inmates for 63 Cents Per Day

by Dale D. Allen

Texas inmates are working their way through prison. The result for the Texas prison system is the lowest operating cost in the Nation—\$8.20 per inmate per day compared to the national average of about \$32 per day.

The Texas prison system is so well known nationally and internationally that the Texas Department of Corrections (TDC) has trained prison officials from several other States and Canada.

W. J. Estelle, Jr., TDC director, explained how the system works, "We run the system based on three concepts: First, inmates must work; second, the prison system must be as self-sustaining as possible; and third, confinement must offer opportunities for rehabilitation and training of inmates."

Having the inmates work makes the system about 75 percent self-sufficient. The inmates grow most of their own food, raise livestock, and operate 22 industries ranging from a soap and detergent factory to garment and shoe factories. Industrial products are used by TDC or sold to tax-supported agencies and political subdivisions.

A large part of TDC's system is the agricultural operation. It includes 15 prison farms covering nearly 100,000 acres. According to James V. Anderson, TDC assistant director for agriculture, in 1980 the TDC agricultural budget provided cotton for the textile mill and broom corn for the broom factory, and fed the prison population for about 63 cents per person per day.

"We must grow enough agricultural products to feed 31,000 inmates as well as our employees," Anderson said. "We offer inmates a 3,000-calorie diet including 1.5 eggs per day; 1 pint of milk per day; free choice of

vegetables; about 10 ounces of beef, pork, poultry, and fish; and fruit, syrup, cheese, and dessert, all of which we try to produce. That amounts to 80,000 pounds of vegetables, 21,600 pounds of meat, 4,500 gallons of milk, and 54,000 eggs per day."

To provide this amount of meat, 5,575 cattle were fed, slaughtered, and processed by inmates last year along with 34,468 hogs, 400,000 poultry, and nearly 3,400 turkeys.

"We grow 34 vegetables plus berries, peanuts, and pecans," Anderson continued. "In addition to the 29 million pounds of vegetables we grew last year, we also grew 400,000 pounds of rice for human consumption and raised 40,000 pounds of catfish."

James M. McGuire, Soil Conservation Service area conservationist at Bryan, coordinates conservation work carried out with SCS assistance on TDC land scattered across seven counties. In fact, McGuire helped lay out the first drainage ditch on TDC property in 1953 when he was a soil conservationist at Angleton. Since then SCS personnel have helped install about 20 miles of major drainage ditches and hundreds of miles of field drains.

Other major cropland practices on TDC land include conservation tillage and conservation cropping systems on nearly 35,000 acres of cropland used to grow feed and edible crops and 10,000 acres devoted to grazing crops. Complete conservation plans have been developed on all 15 farms and cooperative agreements have been signed with local conservation districts.

The farms also have 47,000 acres of pastureland. The units are scattered from Freeport to Palestine, a distance of about 250 miles. About 4,700 acres are planted to cotton.

In an attempt to save fuel, hold equipment costs to a minimum, and to maintain a protective mulch of crop residues on the soil surface, TDC personnel use conservation tillage. Breaking plows that turn under stalks and stems from the previous crop are seldom used. Instead, most tillage is done with chisels, tandem disks, bedders, and cultivators. About one-third of the cropland is deep chiseled every year. Herbicides are used to control weeds as needed.

There are other sidelights to the TDC operation. TDC employees and inmates raise and train horses and dogs. Nearly 900 horses are used as guard mounts and for other work. They also have nearly 600 tracking dogs, mostly bloodhound-hunting hound crosses.

Last summer, inmates refinishing 1 million pieces of school furniture. They also make license plates and validation stickers for Texas, Tennessee, and Illinois. They make boxes, mattresses, mops, dentures, glasses, shoes, clothing, gloves; they renovate school buses, make road signs and dump truck beds for the Texas highway department, operate a records conversion system for tax-supported agencies, construct new facilities built on TDC property, recap tires, and operate other industries.

Dale D. Allen,
public information officer, SCS, Temple, Tex

Now the Cows Can Drink

by Donald W. Brackett
and Douglas A. Bishop

Water for livestock often makes the difference between success and failure in a rangeland grazing system. Ron Ochs, a rancher in Jefferson County, Oreg., overcame many obstacles as he planned a grazing system for a 7,000-acre portion of his ranch. Providing adequate livestock water proved to be the toughest.

Ochs has been working on a range conservation program for many years. He has controlled juniper, seeded grass, and sprayed sagebrush on many acres of poor condition range. He has constructed diversions, developed springs, and built ponds. His grazing plan includes rotation deferred grazing, which gives his pastures occasional rest and assures continued high forage production. He has even converted 2,000 acres of marginal dry cropland to crested wheatgrass, intermediate wheatgrass, and alfalfa.

Water is especially scarce on Ochs' ranch. He has fully developed the few springs found on the place, but they are too far from good native range on the higher slopes. He has built several ponds, but they don't always fill. One pond with a 1,200-acre watershed filled once in 4 years, only to have a rodent-riddled embankment wash out. Ochs says he has hauled a lot of water—and he doesn't like it.

A few years ago he thought he had the problem solved when he installed a gasoline-powered pump, a 3,500-gallon tank, and black polyethylene pipe. But he ran into two problems. First, he had to replace the pipe because rodents chewed through it. Second, Ochs found too much of his valuable time going to maintain the gasoline engine.

Plagued with thirsty cows, hungry rodents, and a troublesome gasoline engine, Ochs developed a larger,

more complex system. First he found a dependable water source near electric power and installed a pump. He attached 9,600 feet of 1½-inch pipe and ran it uphill through 800 feet of vertical relief to a 10,000-gallon storage tank. This time Ochs used a combination of steel and polyvinyl chloride (PVC) (some 300 and some 200 psi) pipe. This deterred the rodents.

Ochs installed several watering troughs where needed to get good livestock distribution. The troughs are gravity fed by 1-inch PVC pipe from the storage tank. He plumbed the old system into the new one and eliminated the gasoline engine. So far, Ochs' system has 12 troughs fed by about 8½ miles of pipeline. The troughs are equipped with float valves, check valves, drains, and pressure regulators—all of which help the system function with a minimum of Ochs' time.

Ochs learned a couple of tricks along the way. The first has to do

with freezing weather raising havoc with trough float-valves. He found he could disassemble the valve and file a groove in the valve seat causing an intentional leak. Leaky valves rarely freeze.

The second trick involved the storage tank. Ochs mounted a red-and-white-striped pole on a float in the tank. The float rises and falls with the water level. With binoculars, he can check the "peppermint stick" water level indicator from a couple of miles away.

Ochs' efforts to improve his ranch have been guided by a conservation plan he prepared several years ago as a cooperator with the Jefferson County Soil and Water Conservation District with help from the Soil Conservation Service. Many of the improvements called for in Ochs' plan have been cost shared under the Agricultural Conservation Program (ACP), administered by USDA's Agricultural Stabilization and Conservation Service. Ochs' own ingenuity,

When Oregon rancher Ron Ochs redesigned his livestock watering system, he came up with a couple of tricks: he installed a "peppermint stick" water level indicator on his storage tank (near right), and he fixed his trough float-valve so it wouldn't freeze (far right).



Rancher Saves Water and Puts Gravity to Work

by Douglas A. Bishop

experience, and hard work combined with SCS planning and technical design assistance and ACP cost sharing have proved to be ingredients in a formula for success.

Historically, Ochs' ranch could support about 250 cows. By following his grazing management plan, including a water system that works, Ochs is now operating with 350 head. And the good news is that current range surveys show he can increase his herd to 450 without damage to his forage supply.

Many operators buy or lease additional land to increase their herd. Ochs is proud that he is accomplishing the same objective with less cost by making the best of what he has.

Donald W. Brackett,
was district conservationist, SCS,
Madras, Oreg., and is now retired.

Douglas A. Bishop,
public information officer, SCS, Portland, Oreg.

A southwestern Oregon rancher has put the natural force of gravity to work and it's paying some mighty powerful dividends.

Allan Pingle, vice president and manager of Mill-Mar Ranch in Jackson County, switched from flood irrigation on 170 acres of hay and pasture to a gravity sprinkler system. With the water he saves from his improved system, he irrigates an additional 70 acres.

Pingle's system also has an environmental plus—improved water quality in nearby Buck Creek. "By improving our water application efficiency and maintaining our new drainage system, we'll just about eliminate the overland flow of water which carries soil, fertilizer, and animal waste into Buck Creek," said Pingle.

The new system provides the added dividend of supplying most of the electrical needs for the ranch.

"Life is going to be a lot easier now that we have gravity on the payroll," said Pingle. "It works 24 hours a day and doesn't cost a dime for labor."

"We had a lot of problems with our old irrigation system," Pingle said. "There were ditches to clean and maintain, and that involved a lot of hand labor and tractor work. About one-third of our water was lost to seepage in the ditch before we ever got it to the field. And, once we did get the water to the field, we couldn't do a good job of spreading it because of the irregular lay of the land. High and low spots caused some areas to be dry and others to be wet; neither was irrigated properly. It was an inefficient, labor-intensive system which did not afford us the kind of hay and pasture production we knew our land was capable of," summed up Pingle.

The source of electrical power was a wheel-type hydroelectric generating plant driven by water rushing down

an 8-inch polyvinyl chloride penstock from 70 feet above the plant. The system worked fairly well but did have some deficiencies. It supplied most of the summertime electrical demand but fell short when wintertime heating was added to the load. Also, some sacrifices had to be made when the Pingles wanted to run the 220-volt electric dryer.

When Pingle decided to make some changes, both in his power-generating plant and his irrigation system, he contacted the Jackson Soil and Water Conservation District and USDA's Soil Conservation Service and Agricultural Stabilization and Conservation Service (ASCS). The result was a contract with the U.S. Department of Agriculture, called a Long-Term Agreement (LTA).

The LTA involves a conservation plan for Pingle's entire ranching operation. The agreement guarantees cost-share funds for many of the conservation practices that will be installed over a 5-year period. SCS provides planning and technical assistance for the LTA and ASCS administers the cost-share funding portion of the agreement.

During the conservation planning process, Pingle and SCS technicians evaluated all aspects of the ranching operation and considered several alternative solutions to problems they encountered. Pingle's original idea was to revamp his surface irrigation system by improving and extending ditches and leveling the fields to a designed grade.

SCS Soil Conservation Technicians Jim Light and Alan Youse came up with the idea of installing a gravity-pressure sprinkler irrigation system. Figures showed that installation cost would not be much more than adding more ditch and leveling fields. And, in the long term, the



sprinkler system would be less costly and less labor intensive. There would be no more ditch maintenance, no more water lost to leaky ditches en route to the field, water would be applied to the field efficiently, and unlike most sprinkler systems, there would be no pumps and no cost for energy. Gravity would do all the work.

SCS technicians and engineers designed Pingle's gravity pressure system to work in conjunction with the power-generating plant that was already in place.

Pingle's LTA called for installation of the sprinkler system the first year. A number of other practices were planned for installation over the remaining 4-year period. Diversions and a grassed waterway are needed to collect water running onto Pingle's ranch from higher elevations. Pastures and hayfields will be reestab-

lished using new, higher-producing grass/legume mixtures. About 1½ miles of cross-fencing will be built. And to go along with the new features installed on the ranch, Pingle will intensify his pasture, hay, and water management techniques.

SCS District Conservationist Ed Weber is confident that the full development of Pingle's conservation plan will result in a threefold increase in hay and pasture production. Presently, the ranch has grazing for about 180 animal units for 7 months and produces about one-third of the hay requirement. "By 1985, when the conservation plan is completely applied, the Pingles should be able to graze about 530 animal units for 7 months and produce nearly all of their hay," Weber said.

Pingle is certain that he has made a sound investment. "In 1975, Pacific

Power and Light wanted \$75,000 to \$100,000 just to bring power the 13 miles from Butte Falls to the ranch," Pingle said. "For about \$130,000 I now have a top-notch gravity flow sprinkler irrigation system and my own power-generating plant." Annual power costs alone for a sprinkler system the size of Pingle's were running about \$5,500 in 1981.

Thanks to careful planning, ingenuity, cost sharing, and a lot of help from the force of gravity, Allan Pingle is optimistic about a bright future for his Mill-Mar Ranch.

Douglas A. Bishop,
public information officer, SCS, Portland, Oreg

Worth More Than 10,000 Words

The Jo Daviess County Soil and Water Conservation District in Illinois erected a sign at a scenic overlook along U.S. 20. The sign explains the advantages of contour stripcropping to the many people who stop along the route to view the scenery. The colorful sign depicts the Raymond Ertmer farm with strips of corn, oats, and hay. It was painted by Bill Darte, who was a Soil Conservation Service soil conservationist in Elizabeth, Ill., and is now SCS district conservationist in Winchester, Ill.

SOIL AND WATER CONSERVATION Permanent Agriculture The World's Future

CONTOUR STRIPCROPPING PROVIDES
THE FOLLOWING ADVANTAGES:

- REDUCES SOIL EROSION
- INCREASES WATER INFILTRATION INTO THE SOIL
- RAISES CROP YIELDS 5-15%
- PROVIDES WILDLIFE FOOD AND COVER
- ENHANCES SCENIC BEAUTY OF LANDSCAPE



COOPERATING:
SOIL CONSERVATION SERVICE
UNITED STATES
DEPARTMENT OF AGRICULTURE

COURTESY OF
JO DAVIESS COUNTY
SOIL AND WATER
CONSERVATION DISTRICT



CONSERVATION Research Roundup

Controlling Runoff from Small Feedlots

Scientists at the USDA North Appalachian Experimental Watershed, Coshocton, Ohio, designed a 3-year study to evaluate quality of runoff water from a typical small paved feedlot and from an unpaved feedlot. They also developed and tested facilities to control pollutants in the runoff.

Each October for 3 years, a 2,600-square-foot feedlot was stocked with 56 steers that were fed corn silage until March. Then the ration was gradually shifted to shelled corn for the last 3 months of growth. The animals were removed in small groups as they reached market weight.

A 400-square-foot settling basin caught all runoff from the paved lot. Overflow from the basin then moved through two fescue filter strips, each 100 feet long by 15 feet wide.

Scientists evaluated the runoff material at four points: as it came off the feedlot, as it overflowed the settling basin, and as it left each of the filter strips.

William M. Edwards, a USDA Agricultural Research Service (ARS) soil scientist, working with ARS Soil Scientist Lloyd B. Owens and Agricultural Engineer Richard K. White of Ohio State University, analyzed the water for chemical oxygen demand, biological oxygen demand, total solids, total and soluble nitrogen, phosphorus, and potassium.

"The settling basin was very effective in reducing solids and nonsoluble materials in the runoff," Edwards said. "The filter strips were more effective in removing the soluble ammonium nitrogen, phosphorus, and potassium. Reduction of these chemicals was as effective in the second filter strip as in the first, indicating the

value of the additional filtering area under these test conditions."

Concentrations of all materials being measured were higher in the latter part of the feeding cycle when the ration was higher in shelled corn than in corn silage. Animals fed silage produce a coarser textured manure which is more easily retained in the settling basin after each runoff event.

Runoff from the paved lot equaled about two-thirds of total precipitation while the unpaved lot lost about one-third as runoff.

Straw Reduces Furrow Erosion

As long as a small amount of plant residue is retained in an irrigation furrow, tillage needed for herbicide applications and seedbed preparations can be conducted with little if any erosion.

USDA's Agricultural Research Service Soil Scientists John S. Aarstad and David E. Miller, Prosser, Wash., found that when straw, adding up to slightly less than a ton per acre, was uniformly placed in furrows, runoff water was cleaner—more free of soil particles—than the water originally entering the furrows.

"If such small amounts of straw are so effective in reducing furrow erosion, it should be possible to perform limited tillage and still leave sufficient residue in the furrows for erosion control," says Aarstad.

Soil erosion remains one of agriculture's worst problems. Dryland erosion has received a lot of publicity lately, but erosion in irrigation furrows can be even worse. Losing 4 to 14 tons of soil per acre from furrows during each irrigation is common.

No-till or reduced tillage is generally accepted as an excellent way to

control this great soil loss. However, a major complaint against this technique has been that some tillage is needed for operations such as herbicide applications and seedbed preparations—more than no-till or reduced tillage customarily call for.

The ability of plant residues to reduce erosion from precipitation runoff has been known for many years, but because furrow irrigation has until recently been practiced on clean-tilled soil, residue effectiveness in controlling furrow erosion was paid little attention.

In 1978, Aarstad and Miller reported that corn residues in irrigation furrows all but eliminated soil erosion completely. They did not at the time determine how much residue was required to provide satisfactory control—information very much needed because tillage destroys residues.

Aarstad and Miller conducted their latest residue study on a medium-textured soil with a 3-percent slope. Even the lowest residue rates tested, a clump of straw every 6½ feet down the furrow length, greatly reduced sediment in the runoff water, but the most effective treatments were ¼ to 1 ton per acre applied uniformly along the furrow.

Chisel plows, disk plows, and disk tillers can all be used to till the soil without destroying much residue, but Aarstad says that techniques for the proper placement of residues in furrows will have to be developed.

John S. Aarstad and David E. Miller are located at the Irrigated Agriculture Research and Extension Center, P.O. Box 30, Prosser, Wash. 99350.

Lynn Yarris,
public information officer, ARS, Oakland, Calif.

Reprinted from the November 1981 issue of *Agricultural Research*.

Moving?

Send present mailing label and new address including zip code to:

U.S. Department of Agriculture
Soil Conservation Service
P.O. Box 2890, Room 0054-S
Washington, D.C. 20013

Official Business
Penalty for private use, \$300

Po
Fe
U.S.
of

NATIONAL AGRICULTURAL LIBRARY

1022771945

AGR 101

U.S. MAIL

U.S. MAIL

SECOND CLASS MAIL

Meetings

May	5-7	Hardwood Plywood Manufacturers Association, New Orleans, La.
	8-11	American Planning Association, Dallas, Tex.
	15-19	League of Women Voters of the United States, Houston, Tex.
	16-20	American Water Works Association, Miami Beach, Fla.
	23-27	National Council of State Garden Clubs, Inc., Los Angeles, Calif.
	26-28	Southern Forestry Conference, Lake Buena Vista, Fla.
June	6-9	American Institute of Architects, Honolulu, Hawaii
	6-11	General Federation of Women's Clubs, Bismarck, N. Dak.
	13-16	Garden Club of America, Rochester, N.Y.
	19-23	National Environmental Health Association, New Orleans, La.
	20-25	Air Pollution Control Association, New Orleans, La.
	20-24	Forest Products Research Society, New Orleans, La.
	20-24	Outdoor Writers Association, Spokane, Wash.
	27-July 1	American Seed Trade Association, Dallas, Tex.
	27-30	American Society of Agricultural Engineers, Madison, Wis.
	29-July 2	National Conference of Editorial Writers, Chicago, Ill.
	17-21	American Association of Nurserymen, Inc., Honolulu, Hawaii
July		

New Publications

Will There Be Enough Food?

by the U.S. Department of Agriculture

The authors of this 302-page book, the 1981 Yearbook of Agriculture, project a high degree of optimism for this Nation's food supply in the future. The major concern is for populations in other parts of the world. Problems such as the loss of prime farmland, soil erosion, and soil and water pollution need to be recognized. The yearbook proposes that the ability to produce enough food for populations in the future depends heavily on how this Nation and others throughout the world deal with these and other problems today.

All 30 chapters are written primarily by specialists in USDA and in State land-grant universities. Featured in the yearbook is a 32-page color photograph section, as well as over 100 black and white photos and numerous vignettes.

A copy of this book may be purchased by sending a check or money order for \$7 to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

National List of Scientific Plant Names

by the Soil Conservation Service

This is a revision of the National List of Scientific Plant Names (NLSPN) published in 1971 by the U.S. Department of Agriculture's Soil Conservation Service. It includes two volumes; a list of plant names and a synonymy.

The NLSPN is useful for preparing technical guides, handbooks, and soil surveys. It can also be useful for abstracting research documents and coordinating plant testing programs among States and regions.

This revision contains symbols for scientific names; accepted names for genera, species, subspecies, and varieties; authors of plant names; symbols for source manuals; family names; symbols for plant habits; and symbols for regions of distribution.

The synonymy (volume 2) includes names and symbols that have been incorrectly used. It can direct the user to the accepted name.

A limited number of single copies are available from USDA, Soil Conservation Service, Distribution Section, P.O. Box 2890, Washington, D.C. 20013.

Source of Seed and Planting Stock

Compiled by the Vegetative Rehabilitation and Equipment Workshop

This publication provides a partial listing of conservation plants available for use in erosion control and resource development and maintenance.

A limited number of single copies are available from USDA, Forest Service, Equipment Development Center, Missoula, Mont. 59801.

Recent Soil Surveys Published

by the Soil Conservation Service

Indiana: White County.

Maryland: Kent County.

Nebraska: Stanton County.

South Dakota: Charles Mix County.

Texas: Val Verde County.